Amendments to the Claims

The listing of the claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (currently amended) A test apparatus for determining air entrainment characteristics of a fluid, the test apparatus comprising:

a reservoir for containing the fluid;

an aerator apparatus operatively connected to the reservoir and configured to selectively aerate the fluid and thereby cause the fluid to undergo a transient air entrainment response period wherein the amount of air entrained in the fluid varies with respect to time;

a density meter operatively connected to the reservoir and configured to measure the density of the fluid at each of a plurality of time values during the transient air entrainment response period;

a heating element sufficiently positioned with respect to the reservoir to selectively heat the fluid; and

a control apparatus operatively connected to the density meter and configured to record the density of the fluid a plurality of times during the transient air entrainment response period.

2. (original) The test apparatus of claim 1, wherein the aerator apparatus includes a hydraulic circuit with an inlet in the reservoir and an outlet in the reservoir, the outlet being positionable above the inlet so that the inlet may be below the surface of the fluid and the outlet may be above the surface of the fluid; and wherein the aerator apparatus includes a pump configured to cause the fluid to circulate through the hydraulic circuit.

3. (currently amended) A test apparatus for determining air entrainment characteristics of a fluid, the test apparatus comprising:

a reservoir for containing the fluid;

an aerator apparatus operatively connected to the reservoir and configured to selectively aerate the fluid and thereby cause the fluid to undergo a transient air entrainment response period wherein the amount of air entrained in the fluid varies with respect to time;

a density meter operatively connected to the reservoir and configured to measure the density of the fluid at each of a plurality of time values during the transient air entrainment response period; [[and]]

a hydraulic circuit with an inlet in the reservoir and an outlet in the reservoir, the outlet being positionable above the inlet so that the inlet may be below the surface of the fluid and the outlet may be above the surface of the fluid; and wherein the aerator apparatus includes a pump configured to cause the fluid to circulate through the hydraulic circuit;

a programmable control apparatus operatively connected to the pump and configured to selectively control the pump to affect the pressure of the fluid in the hydraulic circuit; and

a heating element sufficiently positioned with respect to the reservoir to selectively heat the fluid.

4. (cancelled)

5. (currently amended) The test apparatus of claim [[4]] 3, wherein the control apparatus is operatively connected to the heating element and configured to selectively control the heating element to affect the temperature of the fluid.

6. (cancelled)

7. (original) The test apparatus of claim 1, wherein the density meter is a Coriolis density meter.

8. (cancelled).

9. (currently amended) ~~The method of claim 8,~~ A method of determining air entrainment characteristics of a fluid, the method comprising:

aerating the fluid for a first predetermined time period to result in a first transient response period in which the air entrainment of the fluid varies with respect to time; and

generating a first set of data by recording a corresponding measured density of the fluid for each of a plurality of time values within the first transient response period;

wherein the fluid is substantially unaerated at the initiation of the first predetermined time period, wherein the fluid is characterized by a maximum possible amount of air entrainment; and wherein said aerating the fluid causes the fluid to reach the maximum possible amount of air entrainment.

10. (currently amended) ~~The method of claim 8, further comprising:~~ A method of determining air entrainment characteristics of a fluid, the method comprising:

aerating the fluid for a first predetermined time period to result in a first transient response period in which the air entrainment of the fluid varies with respect to time;

generating a first set of data by recording a corresponding measured density of the fluid for each of a plurality of time values within the first transient response period;

allowing the fluid to deaerate for a second predetermined time period to result in a second transient response period wherein the air entrainment of the fluid varies with respect to time; and

wherein said generating a first set of data includes recording a corresponding measured density of the fluid for each of a plurality of time values within the second transient response period.

11. (original) The method of claim 10, wherein said generating a first set of data includes recording a corresponding temperature of the fluid for each of the plurality of time values.

12. (original) The method of claim 11, further comprising:

determining a corresponding theoretical unaerated fluid density for each of the plurality of time values in the first set of data using the corresponding measured fluid temperature; and

isolating the density effects of air entrainment from the density effects of temperature by, for each of the plurality of time values in the first set of data, determining the difference between the corresponding theoretical unaerated fluid density and the corresponding measured fluid density.

13. (original) The method of claim 12, wherein said determining a corresponding theoretical unaerated fluid density for each of the plurality of time values in the first set of data includes:

causing or allowing the fluid to change from a first temperature to a second temperature in an unaerated state; and

generating a second set of data by recording a corresponding measured fluid density for each of a plurality unaerated fluid temperatures.

14. (original) The method of claim 13, wherein said determining a corresponding theoretical unaerated fluid density for each of the plurality of time values in the first set of data further includes calculating a mathematical representation of fluid density as a function of temperature using the second set of data.

15. (original) The method of claim 12, further comprising determining a rate of air entrainment or disentrainment.

16. (original) The method of claim 10, further comprising substantially maintaining the fluid at a first temperature during the first and second predetermined time periods;

aerating the fluid for a third predetermined time period including a third transient response period in which the air entrainment of the fluid varies with respect to time;

allowing the fluid to deaerate for a fourth predetermined time period including a fourth transient response period in which the air entrainment of the fluid varies with respect to time;

substantially maintaining the fluid at a second temperature different from the first temperature during the third and fourth predetermined time periods; and

generating a second set of data by recording a corresponding measured fluid density for each of a plurality of time values in the third and fourth predetermined time periods.

17. (original) A method for determining air entrainment characteristics of a fluid, the method comprising:

aerating the fluid to cause a first transient response period wherein the air entrainment of the fluid varies with respect to time;

allowing the fluid to deaerate to result in a second transient response period wherein the air entrainment of the fluid varies with respect to time;

generating a set of data by recording a corresponding measured density of the fluid for each of a plurality of time values within the first transient response period and within the second transient response period;

determining a corresponding theoretical unaerated fluid density for each of the plurality of time values in the set of data; and

subtracting, for each of the plurality of time values in the set of data, the corresponding theoretical unaerated fluid density from the corresponding measured fluid density to isolate the density effects of air entrainment from the density effects of temperature.